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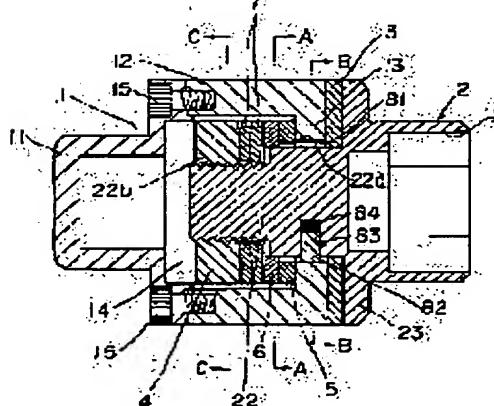
#### (54) CONSTANT TORQUE TIGHTENING TOOL

(57) Abstract:

**PURPOSE:** To set the tightening torque for a bolt in joining a construction member, etc., to a desired torque, by screwing a torque set adjusting member to a shaft part having a torque transmission member and adjusting the pressing force for an elastic member by the torque set adjusting member.

**CONSTITUTION:** A constant torque tightening tool which is used in tightening a screw body by a set torque is equipped with the first body 1 having an operation part 11 and the second body 2 having a holding part 21 for holding the screw body. The second body 2 has a shaft part 22 and an increased

diameter part 23, and a torque transmission part 13 supported in a relatively turnable manner on the shaft part 22 is formed on the first body 1. The first frictional plate 3 is interposed between the torque transmission part 13 and the increased diameter part 23, and a torque set adjusting member 4 is screwed on the



shaft part 22. Further, the second frictional plate 5, pressing plate 6, and an elastic member 7 are interposed between the torque set adjusting member 4 and the torque transmission part 13, and when the tightening for the screw body becomes over a prescribed tightening force, slip is generated between both the bodies 1 and 2.

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## [Claim(s)]

[Claim 1] The 1st body (1) which is the constant torque band which screw-thread objects, such as a bolt head or a nut, are \*\*\*\*ed, and is bound tight with setting torque in the sections screwed on, such as a hole or a \*\*\*\* shaft, and had a control unit (11). It has the 2nd body (2) with the attaching part (21) of said screw-thread object. One side of said 1st body (1) and 2nd body (2) It has a shank (22) and path voluminousness (23). Another side It has the torque-transmission section (13) supported pivotable. said shank (22) -- relativity -- The 1st file plate (3) intervenes between this torque-transmission section (13) and said path voluminousness (23), and set torque controller material (4) is screwed in said shank (22). Between this set torque controller material (4) and said torque-transmission section (13) The constant torque band characterized by intervening the elastic member (7) which presses down with the 2nd file plate (5) and presses a plate (6) and said 1st and 2nd file plates (3), and (5) in said torque-transmission section (13).

[Claim 2] At the time of the rotation to the direction with a bundle of the \*\*\*\* object according to said control unit (11) of said 1st body (1) to between the 1st body (1) and the 2nd body (2) A constant torque band [ equipped with the one direction rolling mechanism (8) which makes said 1st body (1) pivotable to the 2nd body (2), and makes really pivotable said 1st body (1) and 2nd body (2) at the time of the rotation to the return direction of said screw-thread object ] according to claim 1.

[Claim 3] One side of the 1st body (1) and the 2nd body (2) It has the space section (14) and the torque-transmission section (13) which goes in this space section (14). Another side It has said space section (path voluminousness (23 which counters the shank (22) inserted in 14), and said torque-transmission section (13)). The 1st file plate (3) is infix between this path voluminousness (23) and external surface of said torque-transmission section (13). Set torque controller material (4) is screwed in said shank (22) inserted in said space section (14), and between this controller material (4) and the inside of the torque-transmission section (13) which goes to said space section (14) The constant torque band according to claim 1 between which the 2nd file plate (5), the presser-foot plate (6), and the elastic member (7) are made to be placed.

[Claim 4] The constant torque band according to claim 1 which forms the grip section (16) prolonged toward the method of the outside of the direction of a path in the control unit (11) of the 1st body (1).

## [Detailed Description of the Invention]

## [0001]

[Industrial Application] In order to combine the steel materials in the Building Department material etc., in case this invention fixes between said steel materials by bolting of a bolt or

a nut through joint material, it relates to the constant torque band bound tight with the setting torque set up beforehand.

[0002]

[Description of the Prior Art] Although it is made to carry out bolt association of between said steel materials through joint material in order to combine the steel materials in the Building Department material etc. conventionally, a plane of composition is processed on a split face with shot blasting etc., and he raises coefficient of friction, and is trying to join by synthesis with the frictional force between planes of composition, and the force with a suspension, in order that the junction to said steel materials and joint material may raise the shear strength of said bolt at this time. However, if a bolt is bound tight to extent exceeding the yield point when combining between steel materials by the friction joint as mentioned above, the effectiveness by the friction joint of a plane of composition will decline, shearing force will act on said bolt itself, and the problem to which bolt proof stress falls will arise. Then, it is necessary to bind this bolt tight by predetermined clamping force, and for this reason, when performing a friction joint like the above, it sets. Clamping the point of this share bolt using a share bolt with the shear section which will be sheared if the force joins the point of a bolt more than predetermined stress If the nut is bound tight and it becomes a certain predetermined clamping force, said shear section shears, bolting by the clamping force beyond it is made into impossible, and that which was bound tight by the predetermined mounting torque set up with said share bolt is proposed.

[0003]

[Problem(s) to be Solved by the Invention] However, when using said share bolt, it is necessary to prepare specially the exclusive bolt of the special structure which prepared said shear section. In case said share bolt is bound tight, there is not only a problem used as cost quantity, but In case the support of the dedication which clamps the point of this share bolt is needed and it ends with a bundle When the shear section of said share bolt is sheared, this shear section may have deserted the body of a bolt, and may have fallen depending on the case and it worked especially at an altitude of a skyscraper etc., there was a possibility that a falling object might ask people.

[0004] Therefore, this invention aims at offering the constant torque band bound tight by the clamping force of arbitration, not using a special share bolt but being able to use a general-purpose bolt.

[0005]

[Means for Solving the Problem] In the constant torque band which screw-thread objects, such as a bolt head or a nut, are \*\*\*\*ed, and is bound tight with setting torque in the sections screwed on, such as a hole or a \*\*\*\* shaft, in order that this invention may attain the above-mentioned purpose It has the 1st body 1 with a control unit 11, and the 2nd body 2 with the attaching part 21 of said screw-thread object. One side of said 1st body 1 and 2nd

body 2 It has the torque-transmission section 13 supported pivotable. a shank 22 and path voluminousness -- 23 -- having -- another side -- said shank 22 -- relativity -- The 1st file plate 3 intervenes between this torque-transmission section 13 and said path voluminousness 23, and the set torque controller material 4 is screwed in said shank 22. Between this set torque controller material 4 and said torque-transmission section 13 The elastic member 7 which presses down with the 2nd file plate 5 and presses a plate 6 and said 1st and 2nd file plates 3 and 5 in said torque-transmission section 13 was made to intervene.

[0006] Moreover, it is desirable to have the one direction rolling mechanism 8 which makes said 1st body 1 pivotable to the 2nd body 2, and makes really pivotable said 1st body 1 and 2nd body 2 between said 1st body 1 and 2nd body 2 at the time of the rotation to the return direction of said screw-thread object at the time of the rotation to the direction with a bundle of the \*\*\*\* object by said control unit 11 of said 1st body 1.

[0007] Moreover, one side of said 1st body 1 and 2nd body 2 It has the space section 14 and the torque-transmission section 13 which goes in this space section 14. Another side It has 23. the shank 22 inserted in said space section 14, and the path voluminousness which counters said torque-transmission section 13 -- The 1st file plate 3 is infixed between this path voluminousness 23 and external surface of said torque-transmission section 13. The set torque controller material 4 is screwed in said shank 22 inserted in said space section 14, and you may make it make the 2nd file plate 5, the presser-foot plate 6, and an elastic member 7 intervene between this controller material 4 and the inside of the torque-transmission section 13 which goes to said space section 14.

[0008] Moreover, it is desirable to form the grip section (16) prolonged toward the method of the outside of the direction of a path in the control unit (11) of said 1st body (1).

[0009]

[Function] By screwing said set torque controller material 4 to said shank 22, and adjusting the thrust to said elastic member 7 by this set torque controller material 4 The transfer torque from the 1st body 1 to the 2nd body 2 with the attaching part 21 of said screw-thread object with said control unit 11 is adjusted. Only by mounting torque being set as desired torque and adjusting the thrust of said set torque controller material 4 If the load with a bundle which can set it as the torque of a request of the mounting torque when binding said screw-thread object tight, and acts on said 2nd body 2 exceeds the mounting torque set up beforehand Said 1st body 1 can slip to the 2nd body 2, can make bolting beyond it impossible, and can bind said screw-thread object tight with predetermined torque.

[0010] Moreover, since a \*\*\*\* object can use the general-purpose bolt marketed widely by using the constant torque band of this invention, without using a special share bolt As compared with the former which needed to use the share bolt, can mitigate sharply and cost The tool for carrying out rotation actuation of the control unit 11 of said 1st body 1 can

also use the general ratchet wrench, and since fall of a bolt point when using the share bolt like the top before can also be lost, the danger of being based on fall can also be abolished.

[0011] At moreover, the time of the rotation to the direction with a bundle of the \*\*\*\* object according to said control unit 11 of said 1st body 1 to between said 1st body 1 and 2nd body 2 By making said 1st body 1 pivotable to the 2nd body 2, and having the one direction rolling mechanism 8 which makes really pivotable said 1st body 1 and 2nd body 2 at the time of the rotation to the return direction of said screw-thread object the bolt bound tight -- it is necessary to remove -- moreover -- this bolt -- rusted -- etc. -- it is generated, and it can loosen, without making the 1st body 1 slip to the 2nd body 2, even when it \*\*\*\*s by the larger force than the clamping force of a constant torque band and the body must be loosened.

[0012] Moreover, the shank 22 which equips one side of said 1st body 1 and 2nd body 2 with the space section 14 and the torque-transmission section 13 which goes in this space section 14, and is inserted in another side at said space section 14, Have 23, infix the 1st file plate 3 between this path voluminousness 23 and external surface of said torque-transmission section 13, and the set torque controller material 4 is screwed in said shank 22 inserted in said space section 14. the path voluminousness which counters said torque-transmission section 13 -- When the 2nd file plate 5, the presser-foot plate 6, and an elastic member 7 are intervened between this controller material 4 and the inside of the torque-transmission section 13 which goes to said space section 14 Since the interior of said set torque controller material 4 is carried out to said space section 14, said set torque controller material 4 is covered with said 1st body 1. It can prevent changing carelessly the clamping force set up by this set torque controller material 4 according to external force, and the mounting torque set up beforehand can be maintained effectively.

[0013] Moreover, since a part of band which had the grip section [ bolting / the section ] with constant torque by forming the grip section 16 prolonged toward the method of the outside of the direction of a path in the control unit 11 of said 1st body 1 can be formed in elegance Bolting [ with said grip section 16 / said screw-thread object ] immediately after \*\*\*\*ing this constant torque band and doubling with the body When removing this ratchet wrench to the back with [ by this ratchet wrench ] a bundle moreover, without doing an activity which inserts in a ratchet wrench etc. specially and binds it tight to the control unit 11 of a constant torque band in case a screw-thread object is bound tight Said constant torque band \*\*\*\*s, it is not necessary to pay attention to separating and sliding down from the body, and a bolting activity can be done easily.

[0014]

[Example] The 1st example in the constant torque band of this invention is explained based on a drawing.

[0015] The 1st body 1 with the control unit 11 which the constant torque band shown in

drawing 1 fits in a ratchet wrench etc., and carries out possible [ of the actuation with a bundle ], It consists of the 2nd body 2 with the attaching part 21 which holds screw-thread objects, such as a bolt which combines two steel materials, or a nut, to relative rotation impossible. said 2nd body 2 -- a shank 22 and path voluminousness -- 23 -- forming -- said 1st body 1 -- said shank 22 -- relativity -- the torque-transmission section 13 supported pivotable is formed.

[0016] Specifically, said 1st body 1 is formed by making external surface into the shape of a hexagon from said control unit 11 which prepared the flange in the die-length direction inside, and the cylinder part 12 combined with attachment-and-detachment impossible with two or more bolts 15 at the flange of this control unit 11, as shown in drawing 1 and drawing 6 . And by said control unit 11 and said cylinder part 12, while forming the space section 14 in said cylinder part 12 interior, the torque-transmission section 13 prolonged toward the inside of said space section 14 in the disconnection side of said cylinder part 12 is formed in one. In addition, said control unit 11 forms the core in a cavernous condition so that said space section 14 may be followed, and it is attaining lightweight-ization.

[0017] Moreover, as shown in drawing 1 and drawing 7 , said 2nd body 2 makes an inside the shape of a hexagon, receives said screw-thread object, and it forms said attaching part 21 which consists of the crevice which binds this \*\*\*\* object tight and can do it. Said shanks 22 are formed successively inside this attaching part 21, and said path voluminousness 23 which has a larger path than the path of these shanks 22 and an attaching part 21 between this shank 22 and said attaching part 21 is formed continuously. And as shown in drawing 2  $R > 2$ , while forming torque-transmission section fit-in section 22a with the circular peripheral face which fits the torque-transmission section 13 of said 1st body 1 in said path voluminousness 23 side of said shank 22, thread-part 22b is formed in the toe side periphery of said shank 22. In addition, when said attaching part 21 makes a disconnection side the shape of a hexagon, it forms it so that it may have circular inner skin in an inner, and it holds a nut in said hexagon-like section, he is trying to accept the point of a bolt by the inner which consists of said circular inner skin.

[0018] And as said space section 14 of said cylinder part 12 in said 1st body 1 countered in the external surface of said torque-transmission section 13, and said path voluminousness 23 of said 2nd body 2 Insert in said shank 22 and the 1st file plate 3 is intervened between the external surface of said torque-transmission section 13, and said path voluminousness 23 at this time. moreover, to said thread-part 22b of said shank 22 The set torque controller material 4 which formed the notching 41 for rotation actuation in the periphery section as shown in drawing 5 is screwed. Between this set torque controller material 4 and the inside of said torque-transmission section 13 The elastic members 7 and 7 which press the 2nd file plate 5, and the presser-foot plate 6 and said 1st and 2nd file plates 3 and 5 in said torque-transmission section 13 and which consist mainly of a disk spring are made to

intervene. Said set torque controller material 4, the 2nd file plate 5, the presser-foot plate 6, and said elastic member 7 are formed so that it may be settled in said cylinder part 12. [0019] moreover, between said torque-transmission section 13 and torque-transmission section fit-in section 22a At the time of the rotation to the direction with a bundle of said screw-thread object by said control unit 11 of said 1st body 1 Said 1st body 1 is made pivotable to the 2nd body 2. At the time of the rotation to the return direction of said screw-thread object The one direction rolling mechanism 8 which makes really pivotable said 1st body 1 and 2nd body 2 is formed. This one direction rolling mechanism 8 As shown in drawing 4 , while forming two or more ratchet slots 81 which allow the inner skin used as an opposed face with said torque-transmission section fit-in section 22a of said torque-transmission section 13 the rotation to an one direction While forming the pin acceptance hole 83 which receives in said torque-transmission section fit-in section 22a the pin 82 which fits into said ratchet slot 81 and carrying out the interior of said pin 82 to this pin acceptance hole 83 at attitude freedom A spring 84 is arranged in the tooth-back side of said pin 82, and this pin 82 is energized in the direction which fits into said RACHIEETO slot 81.

[0020] In addition, slot 22c for surroundings stops of a pair is formed, and said presser-foot plate 6 is supported to relative rotation impossible at said torque-transmission section fit-in section 22a so that the projections 61 and 61 of the pair formed in the inner skin side of said presser-foot plate 6 may fit in at said torque-transmission section fit-in section 22a, as shown in drawing 2 and drawing 3 .

[0021] After inserting in said 1st file plate 3 first so that said path voluminousness 23 may be countered from said shank 22 side if attachment of a torque band is explained, said cylinder part 12 is fitted in. next, said law -- After fitting in said shank 22 in order of said 2nd file plate 5, said presser-foot plate 6, and said elastic members 7 and 7, Bind tight so that said set torque controller material 4 may be screwed in said shank 22 and said presser-foot plate 6 may press said 1st and 2nd file plates 3 and 5 by said elastic members 7 and 7, and it is set as predetermined mounting torque. After an appropriate time, said control unit 11 is fixed to said cylinder part 12 with two or more screws 15.

[0022] In addition, although a setup of said mounting torque is performed using a torque wrench or a load cell and it may be made to carry out at the time of screwing of said controller material 4, the degree screwing of predetermined time of said controller material 4 is carried out, and it may be made to carry out after fixing said control unit 11 to a cylinder part 12.

[0023] Moreover, while forming accommodation of said controller material 4 so that said cylinder part 12 may be countered 180 degrees in two or more long holes along a hoop direction It forms so that the peripheral face of said set torque controller material 4 may similarly be countered 180 degrees in two or more crevices or holes. After carrying out the

degree screwing of predetermined time of said controller material 4 until it counters said long hole, and fixing said control unit 11 to a cylinder part 12, To the crevice or hole of a pair in said set torque controller material 4 which has countered 180 degrees, from the long hole of said cylinder part 12 Said pin section of a rotation actuation implement with the pin section which can fit into this crevice or a hole is inserted in, said set torque controller material 4 is rotated, and you may make it adjust mounting torque.

[0024] When \*\*\*\*(ing), in spite of covering said shank 22 and the set torque controller material 4 by said 1st body 1, mounting torque can be set up freely.

[0025] Carry out a deer and the torque band in the 1st above mentioned example By screwing said set torque controller material 4 to said shank 22, and adjusting the thrust to said elastic member 7 by this set torque controller material 4 The transfer torque from the 1st body 1 to the 2nd body 2 with the attaching part 21 of said screw-thread object with said control unit 11 is adjusted. Only by mounting torque being set as desired torque and adjusting the thrust of said set torque controller material 4 If the load with a bundle which can set it as the torque of a request of the mounting torque when binding said screw-thread object tight, and acts on said 2nd body 2 exceeds the mounting torque set up beforehand Said 1st body 1 can slip to the 2nd body 2, can make bolting beyond it impossible, and can bind said screw-thread object tight with predetermined torque.

[0026] Moreover, since a \*\*\*\* object can use the general-purpose bolt marketed widely by using the constant torque band of this invention, without using a special share bolt As compared with the former which needed to use the share bolt, can mitigate sharply and cost The tool for carrying out rotation actuation of the control unit 11 of said 1st body 1 can also use the general ratchet wrench, and since fall of a bolt point when using the share bolt like the top before can also be lost, the danger of being based on fall can also be abolished.

[0027] Therefore, this invention can bind the bolt tight by the clamping force of arbitration, not using a special share bolt but being able to use a general-purpose bolt.

[0028] At moreover, the time of the rotation to the direction with a bundle of the \*\*\*\* object according to said control unit 11 of said 1st body 1 to between said 1st body 1 and 2nd body 2 By making said 1st body 1 pivotable to the 2nd body 2, and having the one direction rolling mechanism 8 which makes really pivotable said 1st body 1 and 2nd body 2 at the time of the rotation to the return direction of said screw-thread object the bolt bound tight -- it is necessary to remove -- moreover -- this bolt -- rusted -- etc. -- it is generated, and it can loosen, without making the 1st body 1 slip to the 2nd body 2, even when it \*\*\*\*s by the larger force than the clamping force of a constant torque band and the body must be loosened.

[0029] Moreover, since the interior of said set torque controller material 4 is carried out to said space section 14, said set torque controller material 4 can be covered with said 1st body 1, it can prevent changing carelessly the clamping force set up by this set torque

controller material 4 according to external force, and the mounting torque set up beforehand can be maintained effectively.

[0030] In addition, two or more presser-foot plates 6 which fit into said shank 22 may be used not only in one sheet, and the number of said elastic members 7 and 7 one, and they may be used several many sheets, and not only a disk spring but coiled spring is sufficient as them. When using said two or more presser-foot plates 6, it is desirable to pile up this presser-foot plate 6 and said elastic member 7 by turns.

[0031] Moreover, although said attaching part 21 forms an inside in the shape of a hexagon and inserted the bolt head and the nut in this hexagon-like section, it is made into a chuck method and you may make it hold a bolt head and a nut so that said attaching part 21 can respond to change of the magnitude of a bolt head or a nut.

[0032] Furthermore, in order to set up mounting torque, you may enable it to perform set torque easily by forming a torque accommodation graduation in said shank 22 and said set torque controller material 4, as shown in drawing 1515.

[0033] Next, the 2nd example is explained. A different point from said 1st example of this 2nd example only made reverse the ratchet slot and pin of said one direction rolling mechanism 8.

[0034] That is, as shown in drawing 8 thru/or drawing 11, while forming the pin acceptance hole 83 which receives a pin 82 in the inner skin of said torque-transmission section 13 formed in said cylinder part 12 and carrying out the interior of said pin 82 and spring 83 to it, said pin 82 fits into said torque-transmission section fit-in section 22a in said shank 22, and two or more ratchet slot 81a which allows the rotation to an one direction is formed.

[0035] Moreover, since the path of the inner skin of said 1st file plate 3 is formed greatly and the direction dimension of a path of the part which receives said 1st file plate 3 in said shank 22 is greatly formed in the 2nd above mentioned example When the receptacle section of the bolt in said attaching part 21 can be formed in the inner direction and \*\*\*\*(ed) rather than the formation location of an attaching part 21 shown in drawing 8, only the part which forms said attaching part 21 in the inner direction can shorten the die length of the constant whole torque band.

[0036] Moreover, as said 1st file plate 3 forms a step in the opposed face side of said path voluminousness 23 in said torque-transmission section 13 so that said pin acceptance hole 83 may not be influenced, and it inserts said 1st file plate 3 in this step, you may make it arrange it so that it may become in an unsymmetrical location to said 2nd file plate 5 and said torque-transmission section 13.

[0037] In addition, like [ although each above mentioned example formed said 1st body 1 from the control unit 11 and the cylinder part 12 ] the 3rd example shown in drawing 12, as tabular, said 1st body 1 may form a control unit 11 in the periphery section, and may

form said torque-transmission section 13 in the inner circumference section. In this case, it is desirable to form the wrap covering 9 for said 2nd file plate 5 which fits into this shank 22, the presser-foot plate 6, elastic members 7 and 7, and the set torque controller material 4, to \*\*\*\* the center section of this covering 9 to the point of said shank 22, and to fix to said shank 22 in said 2nd body 2 by 91.

[0038] Since the die length of said control unit 11 and said attaching part 21 can be shortened when \*\*\*\*(ing), the torsion stress concerning a constant torque band can be mitigated, and generating of \*\*\*\* can also be lessened.

[0039] Moreover, although the torque-transmission section 13 was formed in said 1st body 1 and it formed a shank 22 and path voluminousness 23 in the 2nd body 2, even if each above mentioned example forms a shank and path voluminousness in said 1st body 1 and forms the torque-transmission section in the 2nd body 2, it does not interfere.

[0040] Moreover, although it was made bolting in said each example by making said attaching part 21 into the shape of a hexagon doubled with the configuration of a bolt head or a nut, and fitting a direct bolt head or a nut into this attaching part 21 Form the inside of said attaching part 21 for example, in the shape of a square, as shown in drawing 13 , have a hexagon-like inner area smaller than the area of the inside of said attaching part 21, and the socket 92 which can fit into said attaching part 21 is fitted into said attaching part 21. It escapes from said socket 92 to said attaching part 21, and may make it attach removable by the stop 93, and, similarly the inside of said attaching part 21 is formed in the shape of a square. As shown in drawing 14 , the socket 94 which had the fitting section which can fit into said attaching part 21 in \*\* and another side for the larger hexagon-like inner area section than the area of the inside of said attaching part 21 is fitted into one side at said attaching part 21. It is, even if it escapes from said socket 94 to said attaching part 21 and makes it attach removable by the stop 93, and it is \*\*. It escapes and said spring 95 which energizes this omission stop 93 to the inside side of said attaching part 21 is arranged in the tooth-back side of a stop 93.

[0041] When \*\*\*\*(ing), said sockets 92 and 94 are prepared independently and said sockets 92 and 94 are only exchanged according to the magnitude of a bolt or a nut, and even if the magnitude of these bolts or a nut changes, it can bind tight with one constant torque band. In addition, although said attaching part 21 was formed in tubed, an appearance forms in a polygon-like shaft and a tubed socket may be made to fit into the external surface of this shaft in said each example shown in drawing 13 and drawing 14 R> 4.

[0042] When the 4th example is shown in drawing 16 and drawing 17 , moreover, this example While combining a ratchet wrench with the control unit 11 of said 1st body 1 at one, forming said 1st body 1 in tubed one with a stage, forming two or more tooth part 11a in the major diameter periphery of this 1st body 1 and constituting a control unit 11 In the method of the inside of the cylinder part 12 which turns into a narrow diameter portion

with the outer diameter of a minor diameter from this control unit 11. The interior of said 2nd file plate 5 which fits into said shank 22, the presser-foot plate 6, elastic members 7 and 7, and the set torque controller material 4 is carried out, and it covers in said narrow diameter portion 12, and said torque-transmission section 13 is formed in the inner circumference section corresponding to said control unit 11. Moreover, the wrap covering 9 is formed for the cylinder part 12 opening side of said 1st body 1, the center section of this covering 9 is \*\*\*\*ed to the point of said shank 22, and it is fixing to said shank 22 in said 2nd body 2 by 91.

[0043] The grip section 16 prolonged from said 1st body 1 periphery section to the method of the outside of the direction of a path is attached in said control unit 11. And to the die-length direction 1 side of the grip section 16 While preparing frame-like boss section 16a which fits into said control unit 11 which consists of two or more tooth part 11a, to said boss section 16a Pawl maintenance space 16c which carries out opening is prepared in the inside dead air space of this boss section 16a. To this space 16c While pivoting the corpus unguis 17 with two claw parts 17a and 17b which engage with tooth part 11a of said control unit 11, and enable the switch of the direction with a bundle of a \*\*\*\* object possible [ a switch ] through pin 16d The corpus-unguis change-over maintenance device which consists of ball 16e which energizes said corpus unguis 17 to tooth part 11a of said control unit 11, and holds the switch location of said corpus unguis 17, and 16f of springs is established.

[0044] A deer is carried out. By the above configuration said grip section 16 A ratchet wrench will be constituted with said control unit 11. By switching and fastening said corpus unguis 17 and engaging claw part 17a for a lump to tooth part 11a of said control unit 11, can transmit one direction \*\*\*\* actuation of said grip section 16 to the 1st body 1 from said control unit 11, and the other directions double action actuation is made free. Drive rotation of said 1st body 1 will be carried out by both-way actuation of said grip section 16 in an one direction, it will \*\*\*\* through the attaching part 21 of said 2nd body 2, and a fasten lump of the body can be performed.

[0045] Moreover, by said corpus unguis's 17 fastening and engaging claw part 17b for return to tooth part 11a of said control unit 11, in said actuation, conversely, the other directions double action actuation can be transmitted to the 1st body 1 from said control unit 11, using one direction \*\*\*\* actuation of said grip section 16 as free, and fasten return of said screw-thread object can be performed by both-way actuation of said grip section 16.

[0046] Moreover, said grip section 16 prepares 16g of inward-flange sections which have the inner skin made into the minor diameter from the major diameter which constitutes said control unit 11 in said 1st body 1 in the shaft-orientations 1 side of said frame-like boss section 16a. 16g of this flange is made to engage with the step formed between said major diameters and narrow diameter portions 12, and said grip section 16 is held on said 1st

body 1 at balking impossible by making 16g of said flanges pinch by this step and the edge of said covering 9 attached in said shank 22.

[0047] Since said grip section 16 is attached by the 1st body 1 by \*\*\*\*(ing) at balking impossible, it grasps with the constant torque band which consists of said 1st body 1 and 2nd body 2, and the section 16 is made to elegance in part. Like the 1st example Bolting [ with said grip section 16 / said screw-thread object.] immediately after not carrying out fitting of the ratchet wrench at the time of actuation with a bundle, \*\*\*\*ing said constant torque band and carrying out fitting to the body In case it \*\*\*\*s like the 1st example and the body is bound tight, the activity which inserts a ratchet wrench in the control unit 11 of a constant torque band specially is done unnecessary. When workability can be improved so much and this ratchet wrench is moreover removed to the back with [ by the ratchet wrench ] a bundle It is not necessary to pay attention so that said constant torque band may \*\*\*\*, and it can prevent separating and sliding down from the body, therefore it may not fall at the time of an activity, and a bolting activity can be done so much easily.

[0048] Moreover, although said grip section 16 was made into the ratchet-wrench format, form in boss section 16a of said grip section 16 16h of tooth parts which engage with the tooth part of said control unit 11, it is made to carry out fitting of this boss section 16a to said 1st body 1, and you may make it combine said control unit 11 with it to relative rotation impossible in said 4th example like the 5th example shown in drawing 18 . At this time, anchoring to said 1st body 1 of said grip section 16 attaches in the periphery section of this 1st body 1 snap-ring 16i which stops said frame part 16a, and as it is pinched by this snap-ring 16i and the edge of covering 9, it holds it.

[0049] Moreover, said grip section 16 may really be formed in said 1st body 1.

[0050]

[Effect of the Invention] As explained above, the constant torque band of this invention It has the 1st body 1 with a control unit 11, and the 2nd body 2 with the attaching part 21 of said screw-thread object. One side of said 1st body 1 and 2nd body 2 It has the torque-transmission section 13 supported pivotable. a shank 22 and path voluminousness -- 23 -- having -- another side -- said shank 22 -- relativity -- The 1st file plate 3 intervenes between this torque-transmission section 13 and said path voluminousness 23, and the set torque controller material 4 is screwed in said shank 22. Between this set torque controller material 4 and said torque-transmission section 13 Since the elastic member 7 which presses down with the 2nd file plate 5 and presses a plate 6 and said 1st and 2nd file plates 3 and 5 in said torque-transmission section 13 was made to intervene, said set torque controller material 4 is screwed to said shank 22. By adjusting the thrust to said elastic member 7 by this set torque controller material 4 The transfer torque from the 1st body 1 to the 2nd body 2 with the attaching part 21 of said screw-thread object with said control unit 11 is adjusted. Only by mounting torque being set as desired torque and adjusting the

thrust of said set torque controller material 4 If the load with a bundle which can set it as the torque of a request of the mounting torque when binding said screw-thread object tight, and acts on said 2nd body 2 exceeds the mounting torque set up beforehand Said 1st body 1 can slip to the 2nd body 2, can make bolting beyond it impossible, and can bind said screw-thread object tight with predetermined torque.

[0051] Moreover, since a \*\*\*\* object can use the general-purpose bolt marketed widely by using the constant torque band of this invention, without using a special share bolt As compared with the former which needed to use the share bolt, can mitigate sharply and cost The tool for carrying out rotation actuation of the control unit 11 of said 1st body 1 can also use the general ratchet wrench, and since fall of a bolt point when using the share bolt like the top before can also be lost, the danger of being based on fall can also be abolished.

[0052] At moreover, the time of the rotation to the direction with a bundle of the \*\*\*\* object according to said control unit 11 of said 1st body 1 to between said 1st body 1 and 2nd body 2 By making said 1st body 1 pivotable to the 2nd body 2, and having the one direction rolling mechanism 8 which makes really pivotable said 1st body 1 and 2nd body 2 at the time of the rotation to the return direction of said screw-thread object the bolt bound tight -- it is necessary to remove -- moreover -- this bolt -- rusted -- etc. -- it is generated, and it can loosen, without making the 1st body 1 slip to the 2nd body 2, even when it \*\*\*\*s by the larger force than the clamping force of a constant torque band and the body must be loosened.

[0053] Moreover, the shank 22 which equips one side of said 1st body 1 and 2nd body 2 with the space section 14 and the torque-transmission section 13 which goes in this space section 14, and is inserted in another side at said space section 14, Have 23, infix the 1st file plate 3 between this path voluminousness 23 and external surface of said torque-transmission section 13, and the set torque controller material 4 is screwed in said shank 22 inserted in said space section 14. the path voluminousness which counters said torque-transmission section 13 -- When the 2nd file plate 5, the presser-foot plate 6, and an elastic member 7 are intervened between this controller material 4 and the inside of the torque-transmission section 13 which goes to said space section 14 Since the interior of said set torque controller material 4 is carried out to said space section 14, said set torque controller material 4 is covered with said 1st body 1. It can prevent changing carelessly the clamping force set up by this set torque controller material 4 according to external force, and the mounting torque set up beforehand can be maintained effectively.

[0054] Moreover, by forming the grip section 16 prolonged toward the method of the outside of the direction of a path in the control unit 11 of said 1st body 1 Since it is not necessary to prepare fixtures, such as a ratchet wrench, independently, said grip section is included in a band and it is made to elegance in part Bolting [ with said grip section 16 / said screw-thread object ] immediately after \*\*\*\*ing this constant torque band and doubling

with the body When removing this ratchet wrench to the back with [ by this ratchet wrench ] a bundle moreover, without doing an activity which inserts in a ratchet wrench etc. specially and binds it tight to the control unit 11 of a constant torque band in case a screw-thread object is bound tight Said constant torque band \*\*\*\*s, it is not necessary to pay attention to separating and sliding down from the body, and a bolting activity can be done easily.

[Brief Description of the Drawings]

[Drawing 1] It is drawing of longitudinal section of the 1st example in the constant torque band of this invention.

[Drawing 2] the shank of the 2nd body in the 1st example was shown -- it is a notching side elevation a part.

[Drawing 3] It is the A-A sectional view of drawing 1 .

[Drawing 4] It is the B-B sectional view of drawing 1 .

[Drawing 5] It is the C-C sectional view of drawing 1 .

[Drawing 6] It is the front view seen from the 1st body side of drawing 1 .

[Drawing 7] It is the rear view seen from the 2nd body side of drawing 1 .

[Drawing 8] It is drawing of longitudinal section of the 2nd example in the constant torque band of this invention.

[Drawing 9] the shank of the 2nd body in the 2nd example was shown -- it is a notching side elevation a part.

[Drawing 10] It is the D-D sectional view of drawing 1 .

[Drawing 11] It is the E-E sectional view of drawing 1 .

[Drawing 12] It is drawing of longitudinal section of the 3rd example in the constant torque band of this invention.

[Drawing 13] drawing which attached the socket in the attaching part in the constant torque band of this invention is shown -- it is a notching sectional view a part.

[Drawing 14] drawing which attached the socket in the attaching part in the constant torque band of this invention is shown -- it is a notching sectional view a part.

[Drawing 15] It is the drawing which formed the torque accommodation graduation in the shank and set torque controller material in a constant torque band of this invention.

[Drawing 16] It is partial drawing of longitudinal section of the 4th example in the constant torque band of this invention.

[Drawing 17] It is a F-F fragmentary sectional view in the 4th example of drawing 16 .

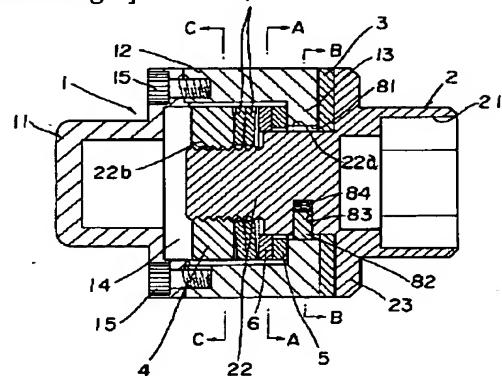
[Drawing 18] It is partial drawing of longitudinal section of the 5th example in the constant torque band of this invention.

[Description of Notations]

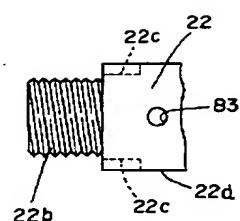
1 1st Body

- 11 Control Unit
- 13 Torque-Transmission Section
- 14 Space Section
- 16 Grip Section
- 2 2nd Body 21 <BR> Attaching Part
- 22 Shank
- 23 Path Voluminousness
- 3 1st File Plate
- 4 Set Torque Controller Material
- 5 2nd File Plate
- 6 Presser-Foot Plate
- 7 Elastic Member
- 8 One Direction Rolling Mechanism

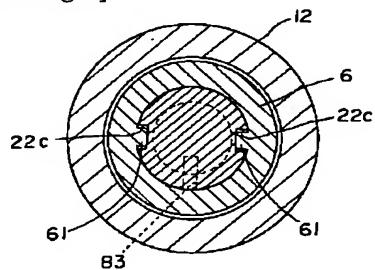
[Drawing 1]



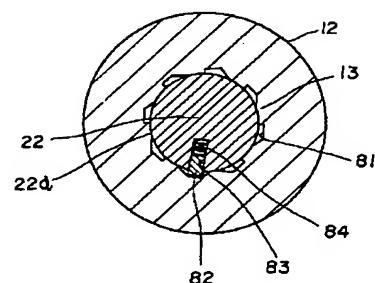
[Drawing 2]



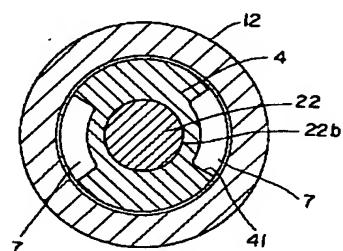
[Drawing 3]



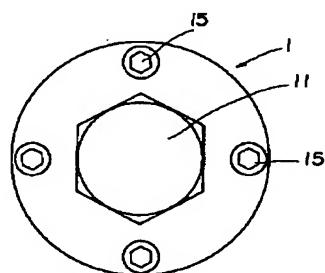
[Drawing 4]



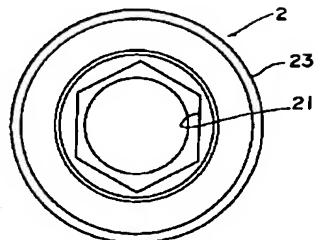
### [Drawing 5]



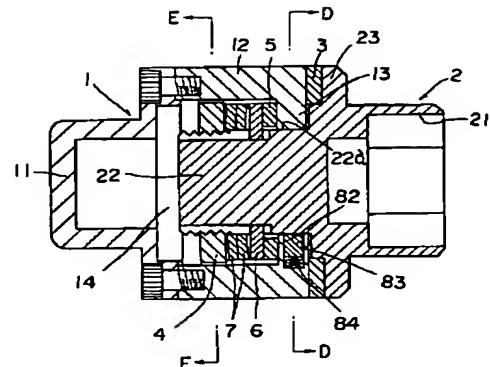
[Drawing 6]



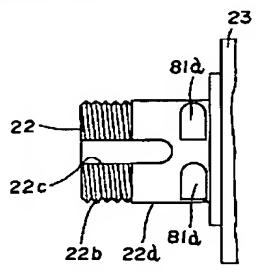
[Drawing 7]



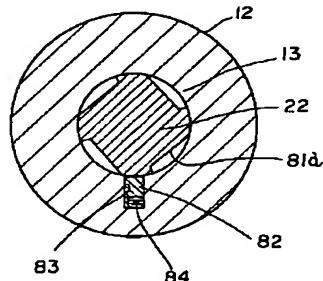
[Drawing 8]



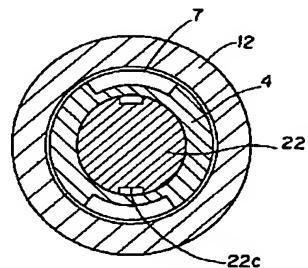
[Drawing 9]



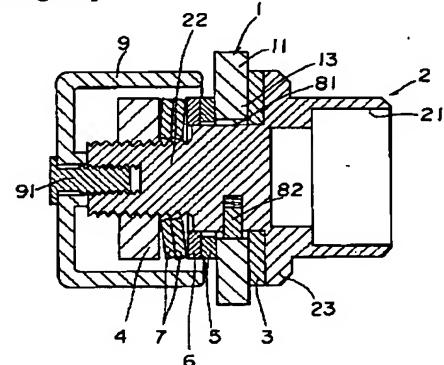
[Drawing 10]



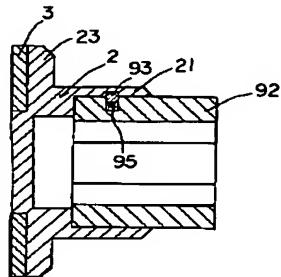
### [Drawing 11]



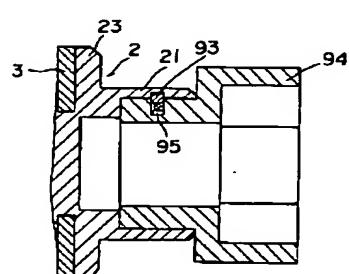
[Drawing 12]



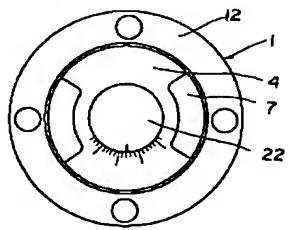
[Drawing 13]



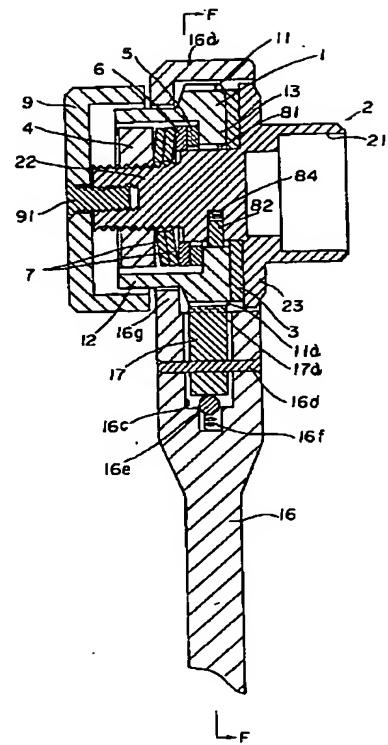
[Drawing 14]



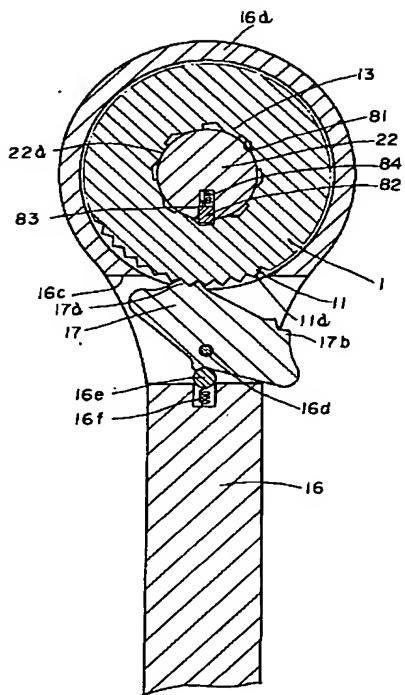
[Drawing 15]



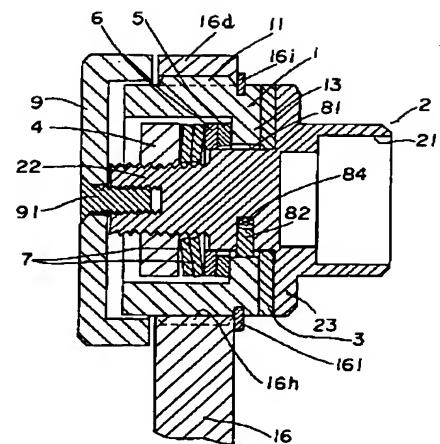
[Drawing 16]



[Drawing 17]



[Drawing 18]



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## CORRECTION OR AMENDMENT

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[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law

[Section partition] The 3rd partition of the 2nd section

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13/46 7234-3C

23/143 7181-3C

F16D 7/02 A 8508-3J

[Procedure revision]

[Filing Date] October 27, Heisei 6

[Procedure amendment 1]

[Document to be Amended] Specification

[Item(s) to be Amended] 0034

[Method of Amendment] Modification

[Proposed Amendment]

[0034] That is, as shown in drawing 8 thru/or drawing 11, while forming the pin acceptance hole 83 which receives a pin 82 in the inner skin of said torque-transmission section 13 formed in said cylinder part 12 and carrying out the interior of said pin 82 and spring 84 to it, said pin 82 fits into said torque-transmission section fit-in section 22a in said shank 22, and two or more ratchet slot 81a which allows the rotation to an one direction is formed.

[Procedure amendment 2]

[Document to be Amended] Specification

[Item(s) to be Amended] 0045

[Method of Amendment] Modification

[Proposed Amendment]

[0045] Moreover, by said corpus unguis's 17 fastening and engaging claw part 17b for

return to tooth part 11a of said control unit 11, contrary to said actuation, the other directions double action actuation can be transmitted to the 1st body 1 from said control unit 11, using one direction \*\*\*\* actuation of said grip section 16 as free, and fasten return of said screw-thread object can be performed by both-way actuation of said grip section 16.

[Procedure amendment 3]

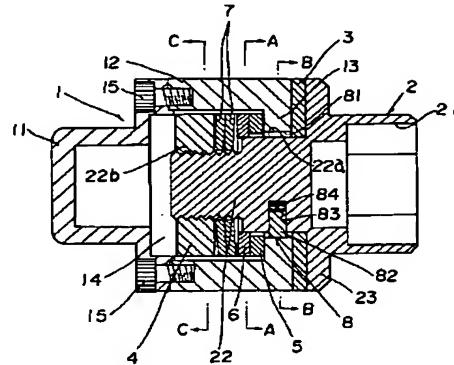
[Document to be Amended] DRAWINGS

[Item(s) to be Amended] drawing 1

[Method of Amendment] Modification

[Proposed Amendment]

[Drawing 1]



[Procedure amendment 4]

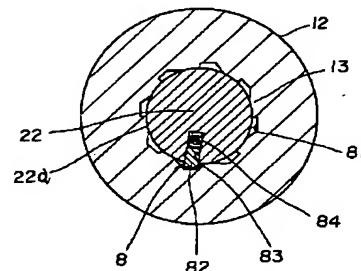
[Document to be Amended] DRAWINGS

[Item(s) to be Amended] drawing 4

[Method of Amendment] Modification

[Proposed Amendment]

[Drawing 4]



[Procedure amendment 5]

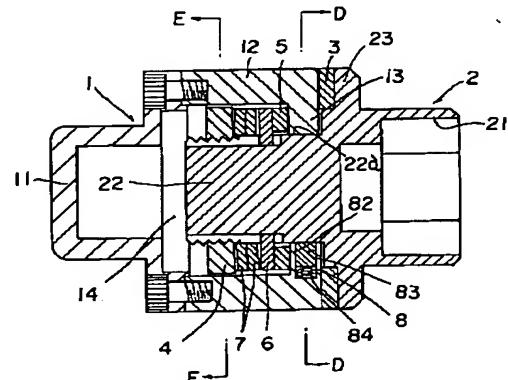
[Document to be Amended] DRAWINGS

[Item(s) to be Amended] drawing 8

[Method of Amendment] Modification

[Proposed Amendment]

[Drawing 8]



[Procedure amendment 6]

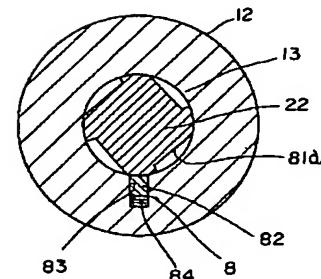
[Document to be Amended] DRAWINGS

[Item(s) to be Amended] drawing 10

[Method of Amendment] Modification

[Proposed Amendment]

[Drawing 10]



[Procedure amendment 7]

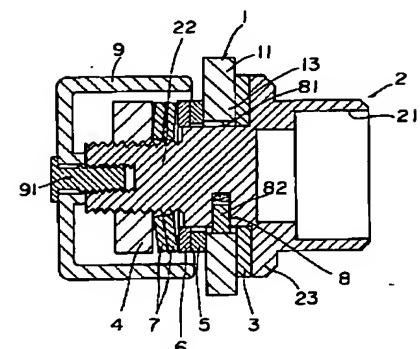
[Document to be Amended] DRAWINGS

[Item(s) to be Amended] drawing 12

[Method of Amendment] Modification

[Proposed Amendment]

[Drawing 12]



[Procedure amendment 8]

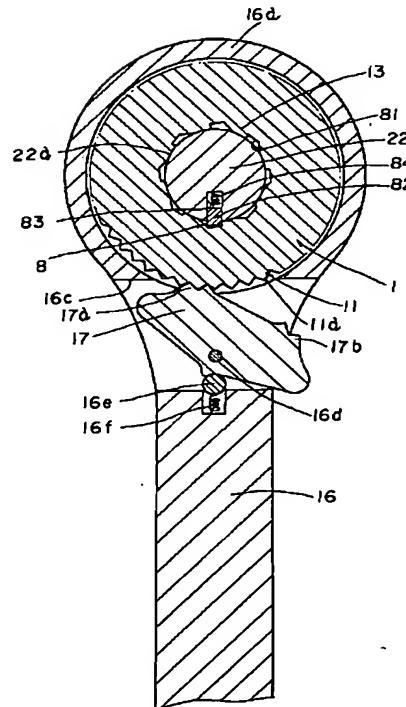
[Document to be Amended] DRAWINGS

[Item(s) to be Amended] drawing 17

[Method of Amendment] Modification

[Proposed Amendment]

[Drawing 17]



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